**SBI3U Dihybrid crosses handout Name:**

NOTE: A dihybrid cross is an extension of a monohybrid cross. It involves 2 genes and up to 4 alleles.

**Example 1:** In watermelons, the green colour gene (G) is dominant over the striped colour gene (g), and round shape (R) is dominant over long shape (r). A heterozygous round green colour (GgRr) watermelon is crossed with another heterozygous round green colour (GgRr) plant. Determine the expected phenotypic ratio for the F1 generation.

Step 1: Determine the possible gametes from each parent.

Step 2: Draw a punnett square of the dihybrid cross and execute the cross.

**Example 2:** In guinea pigs, black fun (B) is dominant over white fur (b), and a rough coat (R) is dominant over a smooth coat (r). If a black, rough furred guinea pig that is homozygous for both traits (BBRR) is crossed with a white, smooth furred guinea pig (bbrr), what are the expected phenotypes in a large litter?

**Practice Problem # 1:**

In some breeds of dogs, a dominant allele controls the characteristic of barking (B) while on a scent trail. The allele for non-barking dogs is (b). In these dogs, an independent gene (E) produces erect ears which are dominant over drooping ears (e). For each of the following mating situations, calculate the phenotype ratio of the offspring:

1. A non-barker who is heterozygous for erect ears is mated with a heterozygous barking dog with drooping ears.
2. A non-barking dog with dropping ears is mated with a heterozygous barking dog with drooping ears.